binations thereof, or files communicating an aforementioned form of multimedia output **188** to an output device (e.g., a video display, speakers).

[**0200**] The multimedia output **188** can be delivered directly or indirectly to a subject. The subject can be the intended recipient of the treatment, training, or testing; a therapist (e.g., physician or audiologist); a person or other animal whom the intended recipient of the treatment, training, or testing is familiar; or combinations thereof.

[**0201**] The subject can directly or indirectly provide subject data **190** to the training engine **182** (as shown) and/or the parameter module **184**. The subject data **190** can include test results (e.g., scores), audio data (e.g., voice samples, room sound test samples), physiological data (e.g., pulse, blood pressure, respiration rate, electroencephalogram (EEG)), or combinations thereof.

[**0202**] The training engine **182** can analyze the subject data **190** and send analyzed results **192** (e.g., analyzed session data) and raw data (not shown) to the parameter module **184**. The analyzed results **192** and raw data can include the performance of the subject during the training. The performance can include a recording of the subject's responses to training. The performance can include a score of the subject's performance during training. The score can include performance results (e.g., scores) for each module and/or for specific characteristics within each module (e.g., performance with Scottish accents, performance with sibilance, performance with vowels, individual performances with each phoneme).

[**0203**] The training engine **182** can use the analyzed results **192** and raw data to modify the training schedule. For example, the schedule modification can be performed automatically by an algorithm in the training engine **182**, and/or manually by a physician, and/or a combination of an algorithmic modification and a manual adjustment. Modifications of the schedule can include increases and/or decreases of total length of training time and/or frequency of training of particular training modules based on the scores; and/or modifications can be based wholly or partially on a pre-set schedule; and/or modifications can be based wholly or partially on a physician's adjustments after reviewing the results of the training.

[**0204**] The second architecture **180** can execute one or more of the training modules described herein. The text of any of the training modules can be visually displayed before and/or during and/or after each training exercise.

[**0205**] **FIG. 32** illustrates that the training engine **182** can have a digital signal processing (DSP) core. The DSP core can be configured to process the parametric data **186**, including audio and/or video data, and/or some or all of the subject data **190**. The DSP core can interact with one or more functions. The DSP Core can communicate with one or more components. The components can be functions within, or executed by, the DSP core, separate programs, or combinations thereof. The components can include a data compressor and/or decompressor, a synthesizer, an equalizer, a time compressor, a mixer, a dynamic engine, a graphical user interface (GUI), or combinations thereof.

[**0206**] The data compressor and/or decompressor can be configured to compress and/or decompress any files used by the training engine **182**. The data compressor and/or decompressor can decompress input data files and/or compress output data files.

[**0207**] The DSP core can download and/or upload files over a network (e.g., the internet). The compressor and/or decompressor can compress and/or decompress files before and/or after the files are uploaded and/or downloaded.

[**0208**] The synthesizer can be configured to create new multimedia files. The new multimedia files can be created, for example, by recording audio and/or video samples, and by using methods known to those having ordinary skill in the art to create new multimedia files using the samples. The synthesizer can record samples of a non-familiar or a familiar voice and/or image to the intended recipient of the treatment, training or testing, for example the voice or image of the intended recipient's spouse or friend.

[**0209**] The new multimedia files can be created for the substantive areas desired for the particular intended recipient of the treatment, training or testing. For example, if the intended recipient performs poorly distinguishing "th" from "s" phonemes, the synthesizer could create new multimedia files and the accompanying meta data with a high concentration of "th" and "s" phonemes.

[**0210**] The equalizer can be configured to control the gain of sound characteristics ranges individually, in groups, or for the entirety of the audio output. The sound characteristics ranges can include frequency, phonemes, tones, or combinations thereof. The equalizer can be configured to process audio output through a head-related transfer function (HRTF). The HRTF can simulate location-specific noise creation (e.g., to account for sound pressure wave reflections off of the geometry of the ears).

[**0211**] The time compressor can be configured to increase and/or decrease the rate of the multimedia output **188**. The time compressor can alter the rate of audio output with or without altering the pitch of the audio output.

[**0212**] The mixer can combine multiple sounds with individual gains. The mixer can combine noise with the multimedia output **188**. The mixer can combine a cover-up sound (e.g., another word, a dog barking, a crash, silence) with the multimedia output **188** such that a target sound (e.g., a target word in a cognitive training exercise) is covered by the cover-up sound. The mixer can increase and/or decrease the gain of the noise and, separately or together, increase and/or decrease the gain of the multimedia output **188**.

[**0213**] The GUI can have one or more settings. Each setting can be pre-included or can be added via an expansion module. Each setting can be particular to a particular subject preference. For example, one setting can be tailored to children (e.g., cartoon animals, bubble letters), one setting can be tailored to a non-English character language (e.g., katakana and hiragana alphabets), one setting can be tailored to English speaking adults, one setting can be tailored to autistic children. The setting of the GUI can be changed or kept the same for each use of the training system **2**.

[**0214**] The dynamic engine can create dynamic effects, for example environmental effects, in the multimedia output **188**. The dynamic engine can create reverberation in audio output. The reverberation can simulate sound echoing, for example, in a large or small room, arena, or outdoor setting.